

DESTINATION CALLING CONTROL SYSTEM AND
DESTINATION CALLING CONTROL METHOD

FIELD OF THE INVENTION

5 The present invention relates to a system and a method
for controlling a call to a destination using a database, and
more particularly to a destination calling control system and
a destination calling control method that are applied to a
terminal with the communication function such as a portable data
10 terminal or a cellular phone.

BACKGROUND OF THE INVENTION

 In general, a cellular phone has a memory function unit
to allow desired destination telephone numbers to be registered
therein. Telephone numbers registered in this memory function
15 unit may be displayed on the display panel of a cellular phone.
Before making a call, the user may display telephone numbers
on the display and select one of them to call a desired party.

 However, because the display screen of a cellular phone,
as well as characters displayed on the screen, is small, there
20 is a problem that, when making a call using the memory function
described above, the user finds it difficult to select and
specify displayed character data (destination telephone number
and name, and so on).

 To solve this problem, a technology allowing a
25 destination to be selected and specified with image data, not

with character data, is proposed. For example, Japanese Patent Kokai Publication JP-A-2-159188 discloses a technology that associates destination images with destination telephone numbers, stores the associated data in a storage unit, sequentially displays the stored destination images on the display panel, and allows the user to select and specify a desired destination image to call the associated destination telephone number. This technology enables the user to determine a destination based on the image data, thus making it easier to select and specify the destination.

SUMMARY OF THE DISCLOSURE

However, according to the technology disclosed in Japanese Patent Kokai Publication JP-A-2-159188, because there is a one-to-one correspondence between destination images and destination telephone numbers and, in addition, stored destination images must be read sequentially from the memory, it takes time to select and specify a desired destination.

To increase operability, some users request that image data generated by photographing a plurality of destinations be displayed so that a desired destination in the displayed image may be selected and specified to make a call. However, because destination images and destination telephone numbers are associated on a one-to-one basis according to the technology disclosed in the above publication, this request cannot be met.

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It is an object of the present invention to provide a destination calling control system and a destination calling control method which feature superior operability and which allow the user to select and specify a destination easily and quickly.

To achieve the above object, the destination calling control system in accordance with the present invention comprises database means; image storage means for storing therein image data; display means for displaying thereon the image data stored in the image storage means; area specification means for allowing a user to specify a desired area within the image displayed on the display means; input means through which the user enters destination data; data registration means for calculating coordinate data of the area specified by the area specification means as a destination image area, associating the coordinate data with the destination data entered from the input means, and for registering the associated data with the database means; destination data search means for calculating the coordinates of the area specified by the area specification means as a destination and for searching the database means for the destination data based on the coordinates; and calling means for calling the destination based on the destination data obtained by the destination data search means.

In the above case, the display means may comprise a touch screen; and the area specification means may allow the

user to specify the area through the touch screen.

The data registration means may extract an outline of a destination object in the destination image area specified by the area specification means, calculate the coordinate data of an area encircled by the outline, associate the coordinate data with the destination data entered from the input means, and store the associated data into the database means.

The destination calling control system may further comprise image capturing means for capturing destination images; title image creation means for creating a title image; and image pasting means for pasting the title image created by the title image creation means and the plurality of destination images captured by the image capturing means and for storing the pasted images into the image storage means.

In the above case, the display means may display the title image of a paste image stored in the image storage means as a reference and allow the user to scroll across a whole of the paste image.

Each destination image and the title image of the paste image stored in the image storage means may be each assigned a number on a numeric key on a ten-key pad, and the display means may display the destination image or the title image in response to the number of the numeric key that is pressed.

The destination image captured by the image capturing means may be a photograph image.

At least one of destination images of the paste image may be a handwritten input image (for example, an image entered by handwriting characters and pictures) created by the title image creation means.

5 The destination calling control method according to the present invention comprises a first step of capturing desired image data and of storing the data; a second step of allowing a user to specify a desired area within an image displayed based on the image data stored in the first step and, at the same time,
10 to enter destination data on the destination image area; a third step of calculating coordinate data of the destination image area specified in the second step, associating the coordinate data with the destination data on the destination image area, the destination data being entered in the second step, and
15 registering the associated data with a database; a fourth step of allowing the user to specify, as a destination, the desired area in the image displayed based on the image data stored in the first step; and a fifth step of calculating the coordinate of the area specified in the fourth step, searching the database
20 for the destination data based on the coordinate, and calling the destination based on the destination data.

In the above case, a paste image, created by pasting a plurality of destination images and a title image, may be stored as the image data stored in the first step, the title
25 image of the stored paste image may be displayed as a reference,

and a desired destination image may be selected by continuously scrolling across a whole of the paste image on the display screen.

A paste image, created by pasting a plurality of destination images and a title image, may be stored as the image data stored in the first step, each destination image and the title image of the stored paste image may be each assigned a unique number on a numeric key on a ten-key pad, and the destination image or the title image may be displayed in response to the number of the numeric key that is pressed.

In addition, a photograph image or a handwritten input image (for example, an image entered by handwriting characters and pictures) may be used as the destination images constituting the paste image.

Furthermore, the coordinate data of the destination image area calculated in the third step may be obtained by extracting an outline of a destination object in the destination image area and by calculating the coordinates of an area encircled by the outline.

In the system in accordance with present invention described above, the user can specify a desired area within the display image as a destination image area and therefore specify a plurality of destination image areas within the display image. The database contains the coordinates of a destination image area and destination data associated therewith. When the user

makes a call, the system searches the database for data based on the coordinates of the area specified in the display image and gives the destination data. In this way, the system in accordance with the present invention allows the user to register a destination object included in the display image, as well as its associated destination data, with the database and to make a call to a desired destination object within the display image based on the database. Therefore, the present invention makes it possible for the user to make a call by simply specifying a desired destination object in the display image.

The system in accordance with the present invention stores paste images, each created by pasting a plurality of destination images and a title image, in the storage unit. Because paste images are classified according to title images, a desired destination image may be displayed quickly by searching for the title image. In addition, even when there are many destinations, the system displays the images of the destinations on the screen to allow the user to visually register or select a desired destination. Therefore, as compared with the conventional system in which it takes long to search for a desired destination image, the system in accordance with the present invention searches for it more quickly.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram showing the overall

FIG. 2(a) to FIG. 2(e) are diagrams showing an example of a paste procedure.

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such as a digital camera to capture an image photographed by the camera. In this embodiment, image data which is of a predetermined size and which contains a plurality of destinations is captured from the camera. The captured image data is sent to the operation control unit 1.

The image data storage unit 4 stores therein paste images for which pasting and editing have been performed by the operation control unit 1. In this embodiment, the image data storage unit 4 contains paste images each composed of image data pasted in a 3×3 matrix form.

The display unit 2, which has a touch screen, displays thereon paste images stored in the image data storage unit 4 and, at the same time, allows the user to touch a desired area with a finger to enter desired data (for example, the user can create handwritten images or add data) or to select data to be displayed. The input unit 3 provides at least a ten-key pad composed of the 1 key to the 9 key (for example, telephone number keys). With this ten-key pad, the user can select data to be displayed or add data. In the description given below, it is assumed that the size of the touch screen on the display unit 2 equals the size of each paste image data stored in the image data storage unit 4 described above.

The database 5 stores therein a table indicating the correspondence between the destination telephone numbers of the destination image areas assigned to the split images

constituting each of the paste images stored in the image data storage unit 4 and the touch screen coordinates of the destination image areas.

The communication function unit 6 communicates with an external terminal. It dials a telephone number searched for by the operation control unit 1 and receives data (for example, receives electronic mail or FAX data) from an external terminal.

The operation control unit 1 pastes image data received via the image data capturing unit 7 and handwritten images created with the use of the touch screen, stores the image, created through pasting, into the image data storage unit 4, registers data with the database 5, searches for a destination telephone number, and performs other related operations. The main components of the operation control unit 1 are an image paste unit 11, a data registration unit 12, and a destination data search unit 13.

The image paste unit 11 pastes image data received via the image data capturing unit 7 and handwritten images created on the touch screen, according to the instructions entered via the touch screen or the instructions entered from the ten-key pad on the input unit 3. An example of the paste procedure executed by the image paste unit 11 is shown in FIG. 2(a) to FIG. 2(e). These steps will be described below.

The nine images, P1 - P9, are pasted during image data pasting as follows. First, the user creates split image P5,

which will be used as a reference image during pasting, by drawing it on the touch screen (See FIG. 2(a)). To create this split image P5, also called a title image, the user executes a program which includes title image creation means (not shown
5 in the figure) of the operation control unit 1.

Then, image data, which will be used as split image P2, is captured via the image data capturing unit 7 and is pasted above split image P5 (See FIG. 2 (b)). Then, image data, which will be used as split image P1, is captured via the image data
10 capturing unit 7 and is pasted to the left of split image P2 (See FIG. 2 (c)). Then, image data, which will be used as split image P4, is captured via the image data capturing unit 7 and is pasted to the left of split image P5 (See FIG. 2 (d)). Executing these steps paste the image data, composed of split
15 images P1 - P9, in a 3x3 matrix form to produce the paste image shown in FIG. 2 (e). This paste image is assigned a title, such as "tennis circle (page 1)", and is stored in the image data storage unit 4. For split images P1-P4 and P6-P9, images taken by a digital camera or images read by a scanner may be used.

20 The data registration unit 12 calculates the coordinates of a destination image area included in a paste image on the touch screen. This destination image area is the area specified by the user via the touch screen or the mouse. Then, the data registration unit 12 associates destination data
25 (destination telephone number, destination FAX number,

destination mail address, name, and so on), entered into the destination data area via the touch screen or the ten-key pad, with the coordinates calculated above and then registers this association data with the database 5. For example, coordinate
5 data and destination data are registered with the database 5 as table data such as the one shown in FIG. 3.

The destination data search unit 13 calculates the coordinates of an area of a paste image displayed on the touch screen when the user specifies it via the touch screen or the
10 mouse and, at the same time, searches the database 5 for destination data, such as a telephone number, based on the calculated coordinates. The destination data searched for by the destination data search unit 13 is sent to the communication function unit 6.

15 Next, the data registration procedure and the destination data search procedure executed by the destination calling control system in this embodiment, in conjunction with the actual operation of the operation control unit 1, will be described in detail.

20 (1) Register Data

The operation control unit 1 displays selection items, such as "Register Data" and "Search for Destination Data", on the touch screen according to the program that is prepared in advance. When the user selects one of displayed items from the
25 touch screen, the operation control unit 1 displays the selected

paste image stored in the image data storage unit 4. The user may select any paste image from the image data storage unit 4 by entering, via the touch screen or the pointing device (such as a mouse or a pen), the title of a paste image to be displayed.

5 For example, entering the title "tennis circle" allows the user to display the paste image shown in FIG. 2 (e). Also, when a predetermined split image (title screen) selected from the split images of the paste image, for example, split image P5 of the paste image shown in FIG. 2(e), is defined as the default, 10 the title screen is always displayed first when the paste image is displayed on the touch screen.

When the desired paste image appears on the touch screen, the user scrolls the displayed image to display a desired image. For example, to display split image P3 contained in the paste 15 image shown in FIG. 2(e), the user must scroll the display screen toward the top-right corner as shown in FIG. 4. Instead of scrolling the screen, the numbers 1 to 9 may be assigned to numeric keys 1 to 9 on the ten-key pad so that a desired split image may be displayed by selecting the corresponding key on 20 the ten-key pad.

When the desired split image appears, the user specifies a desired area (destination image area) in the displayed split image via the touch screen or the pointing device. For example, the user encircles area A with a 25 handwritten line as shown in FIG. 5(a) and, in addition,

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encircles another area, area B, with a handwritten line as shown in FIG. 5(b). The data registration unit 12 calculates the coordinates of areas A and B encircled by the handwritten lines. At this time, the data registration unit 12 may extract the outlines of areas A and B and calculate the coordinates of the areas encircled by the outlines. Doing so prevents the coordinates from being overlapped when area A is near area B.

After specifying areas A and B as destination image areas, the user enters destination data (destination telephone number, destination FAX number, destination mail address, name, and so on) on areas A and B via the touch screen or the pointing device. The data registration unit 12 associates entered destination data on areas A and B with the coordinates of areas A and B and registers the associated data with the database.

(2) Search for Destination Data

The "Search for Destination Data" item comprises the "Search for Destination Telephone Number", "Search for FAX Number", and "Search for Destination Electronic Mail Address" items. The user may select any of these selection items displayed on the touch screen. In the description given below, assume that the user will select "Search for Destination Telephone Number" from "Search for Destination Data".

When the user selects "Search for Destination Telephone Number" from the selection items displayed on the touch screen, the operation control unit 1 gets the paste image from the image

data storage unit 4 and displays it on the touch screen. The user scrolls the displayed image to display the desired split image on the touch screen and selects the desired address from the displayed split image.

5 When the destination is selected, the destination data search unit 13 calculates the coordinates of the specified area and, at the same time, searches the database 5 for the destination telephone number corresponding to the calculated coordinates. The destination telephone number searched for by
10 the destination data search unit 13 is sent to the communication function unit 6. Upon receiving the destination telephone number from the destination data search unit 13, the communication function unit 6 starts dialing the destination telephone number.

15 When the database does not contain data corresponding to the coordinates of the specified area, the destination data search unit 13 displays on the touch screen a message indicating that there is no such coordinate data and prompts the user to register data on the specified area.

20 The search operation that is performed when the user selects "Search for Destination Telephone Number" was described above. When the user selects "Search for FAX Number" or "Search for Destination Electronic Mail Address", the destination data search unit 13 performs the same search operation and then the
25 communication function unit 6 dials the FAX number or electronic

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mail address that is searched for.

Although, in this embodiment, the database search operation is started after the user selects a search mode such as "Search for Destination Telephone Number" or "Search for FAX
5 Number", this process may be changed according to the design. For example, the user may specify a destination image first, search for destination data (destination telephone number, destination FAX number, and so on) on the destination image and, from the destination data that was searched for, specify a
10 desired item (for example, destination telephone number). In this process, the destination data on the specified item is sent to the communication function unit 6.

In this embodiment, a 3×3 paste image is stored in the image data storage unit 4. The paste image size and the number
15 of split images are not limited to this but may be changed according to the design.

In addition, although image data is captured via the image data capturing unit 7 described above, data may be transferred from a camera (such as a digital camera) via an
20 infrared light or a cable. Image data may also be captured via a modem (electronic mail), a scanner, or a recording medium such as an IC card or a memory card.

Furthermore, captured image data may be used with a picture or a handwritten input image entered from the touch
25 screen.

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Moreover, a paste image composed of nine (that is, 3×3) split images (map data), such as the one shown in FIG. 3, may be created as a paste image to be stored in the image data storage unit 4. In this case, the user can select a desired destination (hotel, leisure facilities, and so on) from the map data to call the selected destination. The user may also use the procedure described above to registrar data with the database.

The meritorious effects of the present invention are summarized as follows.

As described above, the system in accordance with the present invention allows the user to register a plurality of destinations with the database using one display image and, when making a call, to call a destination selected from a plurality of destinations that are displayed. Therefore, as compared with the conventional system in which only one destination is called from one display image, operability is significantly increased.

In addition, the system in accordance with the present invention allows the user to attach a title screen to a paste image and to search for a desired destination image easily based on the title image. Therefore, the time required for selecting a destination is much shorter than that required by the conventional system in which destination images to be displayed are read sequentially from the memory.

Furthermore, the system in accordance with the present

invention displays an image on the screen as destination data to enable the user to register or select a destination visually. This means that, even when the display screen is small and there are many destinations, the user can easily register or select destinations. Therefore, as compared with the conventional system in which the user selects a destination from character data (destination telephone number or name), operability is significantly increased.

It should be noted that other objects, features and aspects of the present invention will become apparent in the entire disclosure and that modifications may be done without departing the gist and scope of the present invention as disclosed herein and claimed as appended herewith.

Also it should be noted that any combination of the disclosed and/or claimed elements, matters and/or items may fall under the modifications aforementioned.